

REMARKS

Claims 1-16 are currently pending in the application. Claim 1 is amended to correct a typographical error. Claims 6, 8 and 13 have been made independent by including all of the limitations of their respective base claims. Other claims have been amended to place them in better form. Applicant thanks the Examiner for considering the subject matter of claims 6, 8 and 13 to be allowable.

On the Merits

Claim Rejections - 35 U.S.C. §103:

Claims 1, 3, 4, 7, 9-12 and 14-16 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Seo* (US Publication No. 2001/0022653) in view of *Deck* (US 4,864,515). Applicant respectfully traverses this rejection.

Independent Claim 1:

Independent claim 1 requires in part:

¹a photo-detector (PD) having a photo-diode structure buried in a semiconductor substrate for converting reflected light from an object into charges;

²a plurality of gate means (G1, G2) **having an MOS (Metal Oxide Semiconductor) structure on a semiconductor substrate**

³a plurality of charge storage nodes (C1, C2); and

⁴control means (6) for controlling the switching of said gate means, wherein that to at least two of said charge storage nodes, that is a first charge storage node and a second charge storage node, charges from said photo-detector are alternately transferred and stored synchronizing the light intermittent operation from said light source, by said gate means, that is a first gate means

and a second gate means, so that the charge transfer efficiency from said photo-detector is improved and the distance to the object is determined using the distribution ratio of the stored charges. Emphasis added.

Regarding element 2, as labeled above, the Examiner contends this feature is disclosed in paragraphs [0045] and [0063]-[0070]. It is unclear what feature of *Seo* the Examiner considers to be the “gate means.” Applicant respectfully asks the Examiner to specifically point out the feature which he considers to be a “gate means,” as is required in claim 1.

However, Applicant respectfully submits that judging from FIG. 6 of *Seo*, any possible gate means does not appear to have a MOS structure on a semiconductor substrate. That is, *Seo* does not appear to disclose any metal oxide semiconductor as required by claim 1. For example, in Fig. 2 of the present drawings, storage nodes n+ are shown in a p-type silicon substrate. Gates G1 and G2 are disclosed over a “silicon oxide film” as stated in Fig. 2.

Seo does not disclose this feature. Applicant respectfully submits that nowhere in the specification of *Seo* does it disclose the above mentioned requirement of a MOS structure. As such, Applicant respectfully traverses the rejection.

Regarding element 3, the Examiner contends it is disclosed in paragraphs [0045] and [0063]-[0070]. Applicant is unclear as to what the Examiner considers to be the storage nodes. Applicant respectfully requests the Examiner to specifically point out which feature of the reference he believes discloses a plurality of charge storage nodes.

Applicant does not follow the Examiner’s logic in rejecting the 4th element of claim 1 and respectfully submits that there exists an inconsistency. The Examiner acknowledges that *Seo*

does **not** disclose a plurality of gate means, but only discloses one. See paragraphs [0045] and [0063]-[0070].

Claim 1 requires “charges from said photo-detector are alternately transferred and stored, synchronizing the light intermittent operation from said light source, by said **gate means.**” However, with only one gate, *Seo* does not appear capable of disclosing “synchronizing the light intermittent operation from said light source, by said gate means.” The above mentioned feature requires two or more gates to accomplish the required feature. [Claim 1 requires a plurality of gate means.]

Claim 1 also requires “a determination of distance via the distribution ratio of the stored charges.” However, if the Examiner acknowledges only one gate, it does not appear that it could disclose the above mentioned requirement. It does not appear that *Seo* discloses measuring the distribution ratio of the stored charges.

In fact, *Seo* only appears to disclose measuring the charge from one node, to help determine distance, not using the distribution ratio of charges as required by the claim and not synchronizing the light by said gate means. See paragraphs [0045] and [0063]-[0070].

As such, Applicant respectfully traverses the Examiner’s rejection.

Independent Claim 4:

Regarding independent claim 4, the Examiner has not specifically indicated how he believes the cited references disclose the claimed invention. In fact, claim 4 is not specifically addressed at all. As claim 4 is an independent claim and is sufficiently distinct from claim 1, the

Office must provide some rationale as to how the reference is being interpreted to disclose the required features of claim 4.

As the Office has not done this, Applicant respectfully submits that the *prima facie* burden of showing obviousness has not been met. Applicant respectfully submits that the rejection of claim 4 is therefore inappropriate because of the lack of rationale or any reasoning by the Office.

Dependent claims 3, 7, 9-12 and 14-16:

As these claims ultimately depend from claims 1 and 4, the arguments presented above regarding claims 1 and 4 also apply to claims 3, 7, 9-12 and 14-16. As such, Applicant respectfully traverses the rejection.

Claims 2 and 5 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Seo* in view of *Deck* as applied to claims 1 and 4 above, and further in view of *Kawabata* (US 4,681,432).

Dependent Claims 2 and 5:

As claims 2 and 5 ultimately depend upon independent claims 1 and 4, respectively, the arguments presented above regarding claims 1 and 4 also apply to their dependent claims, 2 and 5.

In view of the aforementioned amendments and accompanying remarks, Applicant submits that the claims, as herein amended, are in condition for allowance. Applicant requests such action at an early date.

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Response
Attorney Docket No.: 052874

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicant's undersigned attorney to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicant respectfully petitions for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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